

*A 3-month special training program enabled nurses in a multiphasic screening unit to perform relatively accurate physical examinations*

## Comparison of Health Appraisals by Nurses and Physicians

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**T**RADITIONALLY, physical examinations in health appraisal have been performed only by physicians. With the increasing numbers of physical examinations as prerequisites for employment or insurance and yearly physical examinations of relatively well persons, physicians are finding it difficult to meet the demand for physical examinations and also maintain quality care of their patients. To cope with this increased demand, efforts have been made to use registered nurses in health appraisals of adults and children throughout the United States (1-3).

Although physicians have traditionally delegated many patient care responsibilities to nurses and more recently to medical assistants, they have expressed reluctance to permit physical examination by the medical assistant. Nurses' participation in health appraisal has been largely in assisting in taking patients' histories and performing certain technical procedures (4, 5).

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A health appraisal center was instituted in September 1967 at the Straub Clinic, a private multispecialty fee-for-service group practice, located in Honolulu, Hawaii. The procedures followed in this unit include the following:

1. Self-administered medical history.
2. Diagnostic tests of vision, hearing, respiratory function, and Achilles' reflex time; electrocardiogram, blood pressure, chest X-ray, and urinalysis.
3. Screening physical examination.
4. Automated laboratory tests, including studies of blood chemistry and blood cell counts.
5. Followup of persons with questionable or abnormal findings or both.

The director of the health appraisal center believed that nurses with additional inservice training could be taught to perform screening physical examinations without loss of quality. Thus, in June 1968, four nurses employed at the health appraisal center were selected to participate in the inservice training program for approximately 3 months. Their training consisted of on-the-job supervised physical examinations and attending sessions with students at the University of Hawaii School of Medicine.

Following this training period, these nurses were assigned to perform the screening physical examination, review patients' histories and results of their laboratory tests, and make tentative recommendations for decision by physi-

cians. The purpose of this study was to analyze and compare the quality of the physical examinations performed by nurses with those performed by physicians.

### Design of the Study

The records of 1,000 persons who had a physical examination by the nurses and seven internists in the health appraisal unit between January 7 and April 23, 1969, were evaluated by Kaku at the University of Hawaii School of Public Health. The nurse examined the patients independently immediately before the physician's examination. The physician, however, had access to the entire chart including the nurse's observations before his examination. This situation can be attributed to the following circumstances.

1. Nurses were encouraged to view their examinations as educational experiences and therefore were not reluctant to share their information.

2. Nurses tended to discuss their findings with physicians to clarify questions they had.

3. Nurses tended to alert physicians to specific findings so the physicians would be sure to check for the presence or absence of those findings.

4. Nurses often alerted physicians to certain facets of a patient's personality, such as apprehension about the examination, depression, or inappropriate comments, or that the patient was tense or in a hurry. Physicians, however, did not share such information with a nurse, even when the patient was examined first by the physician. Also, physicians did not routinely discuss significant personality variations with nurses.

The age and sex of the study group are shown in table 1.

Examinees at the health appraisal center were referred by the Office of Economic Opportunity (14.1 percent), private physicians (29.9 percent), or employers (56 percent). Employers referred regular employees for their annual physical examinations and prospective employees.

The nurse's and physician's interpretations of the patient's self-administered health history, patient's chief complaints, notations on physical examination, and recommendations were

studied, and 16 independent variables were selected for evaluation (table 2). For the purpose of this study, nurses and physicians used standardized worksheets for physical examinations. These permitted checkoff notations for normal findings and expanded descriptions of abnormal findings. At the time of this study, the nurses were taking specimens for Papanicolaou smears but not performing pelvic examinations, examining male genitalia, or checking for inguinal hernias in males.

The dependent variables used in this study were the physicians' and nurses' notations on the patients' charts. Notations were classified into three categories.

1. When the physician and nurse concurred either that there was or was not a sign.

2. The physician noted and specifically classified signs and symptoms not observed by the nurse.

3. The nurse noted and specifically classified signs and symptoms not observed by the physician.

### Results

In examining patients it is important that signs and symptoms of inflammation, abnormal nodes, masses, and abnormal cardiopulmonary sounds are not overlooked. Although scars, pigmentation, and striae can be significant in any diagnosis, they usually are listed as minor findings.

*Concurrences of physicians and nurses.* Of the 16,000 independent variables, which are the product of the number of independent variables

**Table 1. Distribution of the study group, by age and sex, Straub Clinic, January-April 1969**

Age (years)	Male	Female	Total
Total.....	521	479	1,000
10-19.....	48	56	104
20-29.....	164	181	345
30-39.....	103	92	195
40-49.....	98	83	181
50-59.....	82	37	119
60-69.....	18	21	39
70-79.....	7	9	16
80-89.....	1	0	1

multiplied by the number of patients, there were 1,654 (10.3 percent) positive concurrences, 11,253 (70.3 percent) concurrences of no signs, and 3,093 (19.4 percent) discrepancies between the nurse and the physician (table 2). The concurrences observed in this study cannot be incidental at the significance level of  $P \leq 0.01$ . This level means that examinations by the nurse and those by the physician correlated very highly.

*Conditions noted by physicians but overlooked by nurses.* In this study physicians noted and nurses overlooked 797 (5 percent) of the possible independent variables. The largest number of overlooked signs were in the throat. Of the 196 abnormalities in the throat noted by physicians, 159 (79 percent) were not noted by nurses. Four cases of inflammation listed as tonsillitis and one case of hoarseness were overlooked by the nurse. The remaining 151 patients with anomalies in their throats included 80 with no tonsils, 50 with small tonsils, 20 with large tonsils, and one with small tissue in fossa.

Seven cases of middle ear infection and one case of drainage from the ear canal recorded by the physicians were not noted by nurses. Nurses made no notation of 33 cases of cerumen, seven

thickened ear drums, eight abnormalities of the outer ear, three cases of odor of the ear, one case of dizziness, and three cases of rhinitis which were recorded by physicians.

The nurses did not note 19 cases of systolic murmur. Eighteen of these murmurs were functional or classified as indicating "no heart disease." The remaining patient had grade I systolic murmur at the apex, blood pressure 164/80, and his condition was diagnosed as "hypertension controlled" by the physician. Although the murmur was missed by the nurse, she noted "history of hypertension and mild stroke."

Nurses failed to detect 25 of the 40 cases of abnormal heart sounds detected by physicians. Twenty-one of these were "accentuated second sounds" which can be classified as functional murmur.

The remaining four cases were as follows:

CASE 1. "First degree atrial ventricular block" was listed as the diagnosis by the physician, while the nurse's notation was "patient on digitoxin."

CASE 2. "Irregularity of the heartbeat" in the supine position was noted by the physician, but

**Table 2. Nonobservance and detection of signs among 16 variables in 1,000 examinees, Straub Clinic, January-April 1969**

Variables	Signs missed and detected by physicians and nurses						
	A <sup>1</sup>	B <sup>2</sup>	C <sup>3</sup>	D <sup>4</sup>	E <sup>5</sup>	F <sup>6</sup>	G <sup>7</sup>
Total.....	13, 549	12, 050	11, 253	797	2, 296	1, 654	2, 451
Problems <sup>8</sup> .....	846	792	757	35	89	119	154
History.....	751	536	504	32	247	217	249
General appearance <sup>9</sup> .....	696	618	544	74	152	230	304
Skin.....	728	471	409	62	319	210	272
Mouth and teeth.....	806	654	613	41	193	153	194
Throat.....	804	903	747	156	57	40	196
Eyes.....	760	685	590	95	170	145	240
Neck.....	930	824	797	27	133	43	70
Ears and nose.....	860	775	712	63	148	77	140
Heart.....	860	729	668	61	192	79	140
Chest and lungs.....	933	896	865	31	68	36	67
Breasts.....	920	844	825	19	95	61	80
Abdomen.....	771	692	631	61	140	168	229
Back.....	953	908	893	15	60	32	47
Extremities.....	943	849	830	19	113	38	57
Reflexes.....	988	874	868	6	120	6	12

<sup>1</sup> M.D. found no sign or did not describe any.

<sup>2</sup> R.N. found no sign or did not describe any.

<sup>3</sup> M.D. and R.N. agreed there was no sign.

<sup>4</sup> R.N. missed sign, M.D. noted it (B-C).

<sup>5</sup> M.D. missed sign, R.N. noted it (A-C).

<sup>6</sup> Both M.D. and R.N. saw and concurred in sign.

<sup>7</sup> Signs found by M.D. only and by R.N. and M.D. (D+F).

<sup>8</sup> Any condition which, according to his history, the patient considered abnormal.

<sup>9</sup> General appearance included statements such as the patient appeared relaxed, tense, unkempt, thin, or obese.

no notation was made by the nurse. The electrocardiogram report indicated a sinoatrial block.

**CASE 3.** The physician found "accentuated aortic second sound" and diagnosed the condition as "hypertension." The nurse noted "hypertensive vascular disease."

**CASE 4.** The physician noted "occasional extra systole" and diagnosed the condition as "cardiac irregularity." The nurse's notation was "diastolic hypertension (BP 136/94)."

Three cases of distant sounds, six cases of tachycardia, six cases of bradycardia, and two cases of distant murmur were not recorded by nurses.

Nurses did not record abnormal breath sounds in 24 of 46 patients in whom the sounds were detected by physicians. Physicians heard fine rales at the base, side, or back of patients in whom the condition was unobserved by nurses. Other findings were harsh breath sounds and wheezing or rapid breath sounds or both. None of these conditions were diagnosed as pulmonary disease, and the physicians' final diagnoses were either "healthy" or "physical examination essentially negative." One case of emphysema, one case of pain in the chest, one case of concave chest, and four cases of upper respiratory infection were overlooked by the nurses.

*Conditions noted by nurses but overlooked by physicians.* Signs and symptoms in 2,296 (14.4 percent) of the 16,000 independent variables were noted by nurses but were not noted by physicians (table 2). Example of physicians' oversights were the following.

Among the 319 cases of abnormalities of the skin were 30 listed as infection, 16 were lumps, 23 were cases of rash, and one case of skin cancer which physicians either listed as negative or did not note. The remaining 249 cases were listed as "scar," "pigmentation," "tattoo," "acne," or "dry skin," which physicians did not note.

An abnormal condition existed in the ear or nose of 148 persons. Included were 35 cases of middle ear infection and 24 cases of draining and perforation of the ear not confirmed by a physician. The physicians made no notation of 71 cases of cerumen, six cases of dizziness, one case of tinnitus, three cases of abnormalities of the outer ear, five cases of odor-

ous ear, one thickened ear drum, one case of hearing loss, and one case of sinusitis which were recorded by the nurse.

Pertaining to the heart, 170 cases of rhythm disturbance and systolic or diastolic murmur or both and 22 cases of bradycardia or tachycardia were not confirmed by physicians. Examination of the chest revealed 35 cases of abnormal breath sounds, three cases of emphysema, five cases of pain in chest, and 25 cases of upper respiratory infection listed by nurses but not noted or considered negative by physicians.

In the breast area 60 cases of lumps and nodules or mastitis and 35 cases of scars and striae were noted by nurses, but not by the physicians.

The 140 abnormalities of the abdomen included 25 cases of abdominal tenderness, masses, or palpable liver detected by nurses but listed as negative or not noted by physicians. The remaining 115 conditions not confirmed by physicians were abdominal scars, striae, and umbilical hernia.

#### Discussion

The delegation of initial health appraisal of apparently well persons to a nurse who has received additional inservice training in the technique of physical examination and diagnosis is relatively new. Results of this study revealed a tendency of nurses to record abnormalities, even minor ones, more completely than physicians. These abnormalities generally related to pigmentation, scars, and auscultation of functional heart and breath sounds.

Selective examinations by physicians, particularly in the auscultation of heart and breath sounds, appear to be advisable at this time, but development of greater skill by nurses may make such examinations by physicians unnecessary in the future.

When a nurse did not note an observation, the probable oversight entailed auscultation of heart and breath sounds. However, failure to detect significant signs and symptoms did not occur.

Questions emerge about conditions noted by a nurse but overlooked by a physician. Because they had access to the nurses' descriptions, and nurses usually communicated closely with the

physicians, it could be presumed that what physicians did not record was confirmation of the nurses' notes. For example, a skin cancer was noted by the nurse, and her entry on the chart stated that the patient had been treated by a dermatologist. The internist in the health appraisal center was informed of the situation, read the chart, saw the local condition, but did not record it. The skin cancer was confirmed from the patient's history. The failure of the physician to indicate this observation in his diagnosis might represent an oversight or his assumption that a recorded diagnosis was unnecessary because it was documented in the patient's history.

The purpose of the study was to appraise the quality of physical examination by nurses. Because physicians made the final diagnosis, the initial health appraisal was delegated to a nurse, and there was no referee. The concurrence of positive and negative findings was significantly high, and the nurses' failures to perceive or their omissions involved few serious conditions. These facts support the validity of nurses' physical examinations as a substitute for physicians' examinations.

### Summary

A comparative study of four registered nurses' and seven physicians' observations in the health appraisal of apparently well persons was undertaken by reviewing and evaluating 1,000 patients' records. The objective was to see how well nurses who received 3 months of additional inservice training could perform physical examinations and make diagnoses. The physicians' examinations were the criteria for determining the accuracy of the nurses' findings.

In 10.3 percent of the 16,000 independent

variables, there was positive concurrence of findings by the physician and the nurse. Both the physician and nurse concurred that there was no finding in 70.3 percent of the variables. In 5 percent of the variables, the physician found a sign or symptom that the nurse did not. In 14.4 percent of the variables, the nurse found signs but the physician did not. Nurses had a tendency to record findings more completely than physicians. These notations generally pertained to observations of skin pigmentation and scars as well as auscultation of functional heart and breath sounds.

In view of the results of this study, there were few serious differences in recorded findings when the nurses and the physicians examined the same patients. For further validation of this observation, more fully controlled studies will be necessary.

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### Tearsheet Requests

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